

(No Model.)

E. A. TRACY.
SURGICAL SPLINT.

No. 538,300.

Patented Apr. 30, 1895.

Fig. 1.

Fig. 2.

Fig. 3.

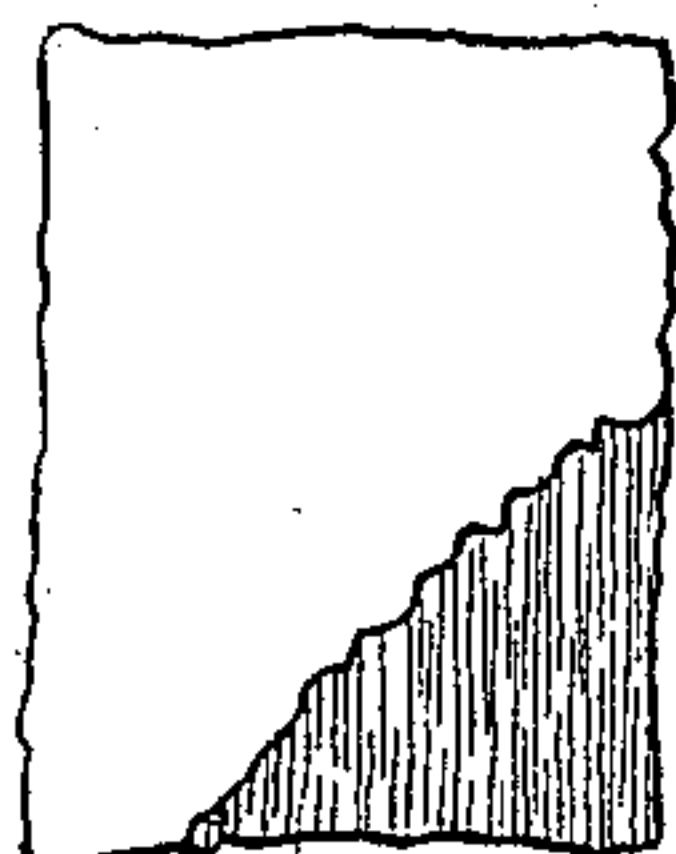


Fig. 4.



Fig. 5.

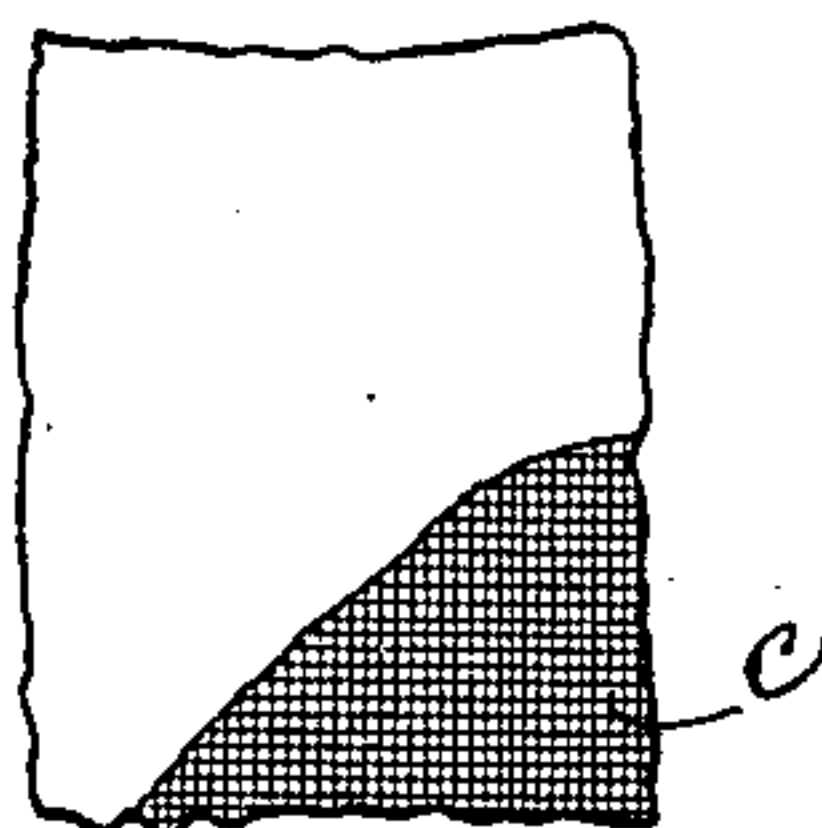
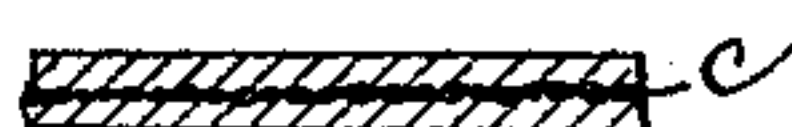


Fig. 6.



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Witnesses
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UNITED STATES PATENT OFFICE.

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TO CHARLES H. FISH, OF MANCHESTER, NEW HAMPSHIRE.

SURGICAL SPLINT.

SPECIFICATION forming part of Letters Patent No. 538,300, dated April 30, 1895.

Application filed December 19, 1892. Serial No. 455,639. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. TRACY, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Surgical Splints, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a splint to be used in the treatment of fractures. Splints for this purpose are generally made of wood or metal, a construction which frequently precludes the accurate fitting of the splint to the limb or part to which it is to be applied, and in many cases the limb or part to be treated is incased in plaster of paris molded upon it, a plan which insures the accurate fitting of the plaster to the limb but which is objectionable, owing to the extreme rigidity of the plaster when set and to its weight, and there are other disadvantages in the use of plaster of paris which are wholly overcome by the present invention as will be readily understood by those familiar with the use of appliances of this kind. Splints have also been made of felt having its pores filled with a gummy compound which is more or less plastic when hot and which stiffens upon cooling. In these splints the real body or substance of the splint is the gum compound, the felt serving rather to diminish the brittleness or contribute some tenacity than to contribute to the stiffness of the splint.

The splint forming the subject of the present invention is composed wholly or mainly of a pulpy material which when in one condition, as for example dry, is comparatively rigid, although having a certain amount of flexibility accompanied by considerable elasticity or resilience, and which when in another condition, as for instance, saturated with moisture is extremely plastic and readily assumes any shape that may be imparted to it, and retains the said shape when subsequently dried. The material which I have found best for this purpose is wood pulp made in thick sheets such as commonly produced for paper stock, and said sheets have incorporated in or united to them one or more layers of fabric or of other fibrous material which may be

laid with relation to the sheet in accordance with the results desired.

A splint embodying this invention may be made from a sheet or slab of the pulp material which is cut approximately to the desired shape in outline and is moistened and thereby rendered soft and plastic, and is then applied to the limb or other part to be treated, and molded to proper shape thereon, and when subsequently dried it retains the said shape but resumes its comparatively rigid condition and thus forms an efficient splint. The splint after it has been thus molded to shape and dried, is treated with some moisture repellent material, such for example as shellac, varnish, gutta percha, tar, &c., in order to prevent the subsequent absorption of moisture and resultant softening of the splint. In some cases such material may be applied merely as a coating to exclude the moisture, and in other cases materials may be applied which penetrate the body of the pulp and harden therein, thus increasing the rigidity of the molded splint. Such further stiffening or hardening may be effected by applying glue, starch, or some of the soluble silicates as for example potassium or sodium silicate to the material, and there are materials which impart both the qualities of increased stiffness and of repelling moisture.

By properly shaping the flat blanks from which the splint is formed a great variety of splints for especial purposes can be produced, it being possible to obtain effective splints by this method to meet almost every requirement.

Figure 1 is a side elevation of a flat blank for a simple form of splint; Fig. 2, a side elevation of the finished splint made therefrom; Figs. 3 and 4, a side view and a sectional view respectively of one form of material that may be used in the production of splints of this kind, and Figs. 5 and 6 similar views showing a modification of said material.

The blank *a* Fig. 1, is cut from a sheet of wood pulp board composed of wood fiber properly laid as in paper making, or of such pulp with other material as will be hereinafter described. The said material when dry is very stiff although somewhat flexible but with a high degree of elasticity or resilience, so

that when bent or distorted within certain limits it will resume its original shape when the distorting force is removed. The said material, however, when moistened, loses a
5 greater portion of its rigidity and becomes completely inelastic so that it may be readily bent or shaped and when so bent will retain the shape imparted to it, and when a splint is
10 applied to the limb or part that is to receive the splint, and is molded to shape directly thereon, so that it fits the limb perfectly as a plaster cast. The splint when so molded to shape may be permitted to dry on the limb, or
15 preferably to save time, is removed therefrom and rapidly dried, when it will be found to have resumed its property of stiffness and resilience although retaining the shape, to which it was molded, and it may then be applied to
20 the limb and will act effectively as a splint therefor.

In some cases the bending or molding may put considerable strain upon the softened fiber which might weaken the resulting splint to
25 too great a degree, and for such cases the pulp material preferably has incorporated in it a longer fiber such for example as oakum, jute, cotton, or other fibrous material, which may be laid substantially parallel as shown in Figs.
30 3 and 4, thus increasing the toughness or strength of the material in one direction more than in the other, or the said fibers may be more or less interlaced or crossed as occasion may require, or preferably when the material
35 requires strengthening in all directions one or

more layers of woven fabric is incorporated in the material as shown at c Figs. 5 and 6. The material may be further strengthened or stiffened by incorporating suitable substances therein as before specified, and if such sub-
40 stances are to be incorporated in the material from which such blanks are made, they should be of proper nature to soften and become plastic by moistening or other analogous treatment, and of subsequently setting or
45 hardening after the material has been properly molded; and in many cases it will be necessary or desirable after the splint has been molded in shape as illustrated in Fig. 2, to
50 coat or impregnate the same with moisture repellent material so as to prevent it from subsequently absorbing moisture and softening after it is applied to the fracture; and as before stated many of the materials with which
55 the fiber may be impregnated have both properties of repelling moisture and increasing the rigidity of stiffness of the material.

I claim—

A surgical splint formed of wood-pulp slabs or boards having a fibrous reinforcing ad-
60 dition, and cut and adapted to be molded to shape and rendered moisture repellent and stiff, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of
65 two subscribing witnesses.

EDWARD A. TRACY.

Witnesses:

JOS. P. LIVERMORE,
JAS. J. MALONEY.